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Kommissie voor Toegepast Wetenschappelijk Onderzoek

in de Zeevisserij (T.W.O.Z.)

(Voorzitter : F. LIEVENS, directeur-generaal)

FIRST RESULTS OF ELECTRO-FISHING EXPERIMENTS

G. VANDEN BROUCKE

Onderwerkgroep "Techniek in de Zeevisserij"

Mededelingen van het Rijksstation voor Zeevisserij (CLO Gent)

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Introduction.

Within the scope of the investigations with as objective more selective and more efficient fishing gear a study on the theoretical application of the electro-fishing was carried out. As recent investigations abroad (U.S.A., Canada, Great Britain, Iceland, West Germany, France, the Netherlands) have shown that with electrical gear good catches can be obtained, its possibilities for the Belgian seafisheries were examined in practice.

The application of this new method is function of the fish species, the size of the fish and the fishing area. It is therefore necessary to consider the different applications simultaneously with the local circumstances and to use apparatus adjustable within broad limits. With this object in view a series of experiments was started on shrimps and on flatfish.

The report presents a brief description of the fishing gear, the experimental conditions and the results obtained.

1. Fishing gear.

The experiments had a preliminary character. They concerned mainly the possibilities as regards the disposition of the electrodes and the catches obtained.

In order to be able to compare the electrified net with an ordinary net the experiments were carried out on board a beam trawler.

The electrified shrimp net was mounted on the port-side and the ordinary net on starboard. In this manner the variable factors as fishing

ground, weather conditions, period, stock abundance, etc. could be considered as similar for both nets.

The electrodes between which an electrical field was generated had as function to startle the shrimps and/or the flatfish from the sea-bottom. This method presented a major problem, viz. the protection of the electrodes against damage. Moreover the electrical field may not cause any frightening effect in front of the net. This last point is very important for the catchability.

The first problem, the damage to the electrodes, was partially eliminated by mounting the electrodes in the direction of the towing speed. This resulted in on the one hand that the electrodes followed up quite well the roughness of the bottom and that good contact thus existed between bottom and electrodes and on the other that the chance of damage to the electrodes was negligible.

The frightening effect in the front part of the net opening may be caused by the electrodes or the electrical field being placed too near. To ensure that the electrical field was effective under the upper part of the net, the electrodes were isolated till they touched the bottom and were fixed to the beam via cables.

Two cables from the impuls generator to the net guaranteed the power-supply. These cables were shot and hauled together with the fishing gear.

The feeding of the impuls generator on board the vessel was obtained by a motor-alternator unit of 2.5 KVA with an alternating tension of 220 Volt.

2. Experimental conditions.

(a) Vessel.

The experiments were carried out on board a beam-trawler of 29.30 gross tonnage and equipped with a motor of 200 HP.

(b) Fishing ground.

The experimental fishing was carried out off the Belgian coast between Zeebruges and Knocke.

(c) Period and weather conditions.

The experiments took place during the month of September 1972 under varying weather conditions.

3. Results and conclusions.

The objectives of the research were to some extent different for flatfish and for shrimps. As regards flatfish a selective fishery and a simplification of the fishing gear (the substitution of heavy ticklers by light electrodes) were aimed at.

With respect to the shrimp fishery it was endeavoured to develop a switch-over from the traditional night-time fishery to a day-time fishery. Simultaneously, an attempt was made to increase the selectivity.

a. Results.

Two main points were examined, viz. the catches and the selectivity.

As regards the catches, the contents of the cod-end of both nets were compared for 18 hauls on a total of 28 hauls. Ten experimental hauls were rejected because of technical or fortuitous cause (net damage, etc.).

The catches consisted mainly of shrimps and soles so that no comparison for other flatfish was possible. The contents of the cod-end of the ordinary net was taken as reference and the catch obtained by the net with electrodes was expressed in percentages of the catch obtained by the ordinary net.

The input peak tension was 100 volt and the frequency 2 Hertz. This adjustment was kept indentical during 18 hauls in order to obtain a significant comparison.

The results were rather favourable :

- for shrimps : 100 % O.N. - 144 % E.N.
- for commercial soles : 100 % O.N. - 350 % E.N.
- for immature soles : 100 % O.N. - 76 % E.N.

The selectivity of the net with electrodes gave no distinct results for shrimps.

For soles a certain degree of selectivity was ascertained especially for the immature soles.

b. Conclusions.

- As most important conclusion can be mentioned that the electro-fishing presents good perspectives as regards :

- the catchability for shrimps and soles
- the selectivity for soles.

- Research must be continued along the same lines but with another adjustment of the impuls generator (frequency, peak tension), with varying distances between the electrodes and under different environmental conditions.

- Finally, the investigations should lead to the development of a compact instrument which may be fixed on the beam or on the headline of the nets ; the cable connection between vessel-fishing gear would then become unnecessary.